

Trial 4. HYC Barley Disease Management (FAR WAA B22-04)

Objective: To develop profitable and sustainable approaches to disease management in HRZ barley.

Key Points:

- Levels of Net Form Net Blotch (NFNB) and Spot Form Net Blotch (SFNB) were elevated in 2022 compared to previous years, producing a high amount of disease pressure, particularly in RGT Planet.
- Fungicide management had a significant effect on yield with a more robust program, including a seed treatment and *three* applications throughout the season, producing a significantly higher yield, *approximately* 0.42 t/ha above the average (Table 1).
- Although not reflected entirely in the yield, the untreated plots showed higher levels of NFNB and SFNB throughout the entire growing season, with a lower green leaf retention (GLR) (Table 3).
- In general, more complex fungicide programs returned a higher NDVI value throughout the season when compared to the control, indicating a healthier and greener plant (values not shown).

Treatments: 4 fungicide management levels applied to RGT Planet.

Table 1. Influence of management strategy of wheat grain yield (t/ha) and protein (%).

Treatment				Yield		Protein	
	GS00	GS31	GS39-49	GS59	t/ha	%	
1	---	---	---	---	4.28 cd	11.2	-
2	Systiva	Prosaro 300 mL/ha	Radial 840 mL/ha		4.57 b	11.2	-
3	Systiva	Prosaro 300 mL/ha	Radial 840 mL/ha	Opus 500 mL/ha	4.50 bc	11.3	-
4	---	Prosaro 300 mL/ha	Aviator Xpro 420 mL/ha		4.37 bcd	11.3	-
5	---	---	Aviator Xpro 420 mL/ha		4.43 bc	11.1	-
6	---	Prosaro 300 mL/ha	FAR F1-19 750 mL/ha		4.40 bcd	11.4	-
7	---	FAR F1-19 750 mL/ha	Radial 840 mL/ha		4.52 bc	11.2	-
8	---	Prosaro 300 mL/ha	----		4.37 bcd	11.4	-
9	--	Tilt 500 250 mL/ha	----		4.16 d	11.5	-
10	Systiva	---	Radial 840 mL/ha	---	4.42 bc	11.2	-
11	---	Prosaro 300 mL/ha	Radial 840 mL/ha	---	4.43 bc	11.5	-
12	---	Prosaro 300 mL/ha	Aviator Xpro 420 mL/ha	Opus 500 mL/ha	4.44 bc	11.5	-
13	---	Aviator Xpro 420 mL/ha	Radial 840 mL/ha		4.52 bc	11.4	-
14	---	Prosaro 150 mL/ha	Radial 420 mL/ha		4.38 bcd	11.4	-
15	Systiva	Prosaro 300 mL/ha	Aviator Xpro 420 mL/ha	Opus 500 mL/ha	4.86 a	11.3	-
Mean					4.44	11.3	
LSD (P=0.05)					0.26	ns	
P-Value					0.004	0.675	

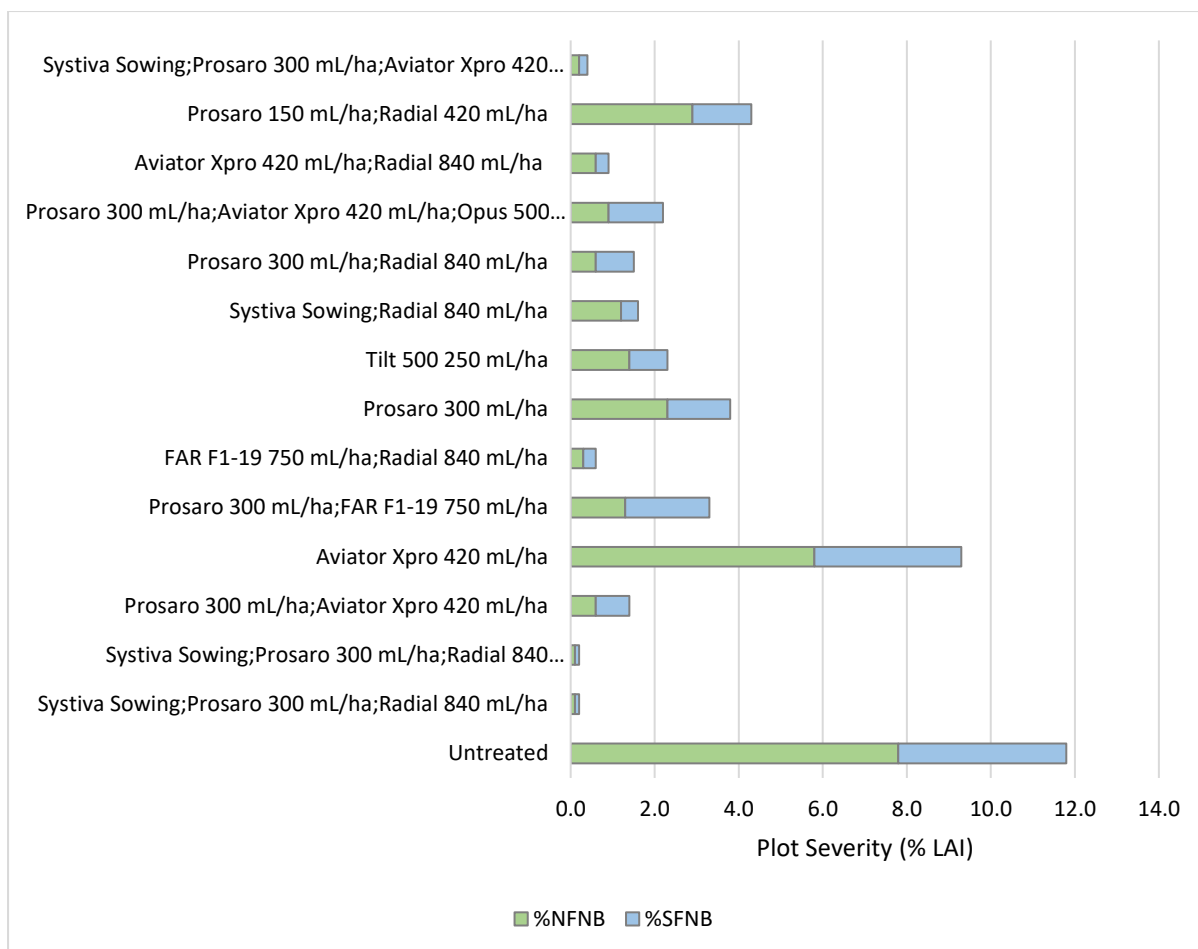


Figure 1. Net Form Net Blotch (NFNB) and Spot Form Net Blotch (SFNB) plot disease severity (% LAI), 8 August, GS48.

When looking at plot severity of Net Form Net Blotch (NFNB) and Spot Form Net Blotch (SFNB), the untreated plots had a significantly higher level of both diseases (7.8% and 4%). With the second spray timing (GS39-49) being applied at the end of July, treatments with only a single spray at this timing (treatment 5) are unlikely to reflect the full effects of the fungicide at this assessment. The half rate of 150 mL Prosaro and 420 mL Radial allowed for significantly higher levels of NFNB (2.9%) and slightly higher levels of SFNB (1.4%) when compared to treatment 11 which had the full rates. Treatments with Systiva at sowing and a fungicide application at GS31 had significantly lower levels of both diseases.

Table 2. Net Form Net Blotch (NFNB) and Sport Form Net Blotch (SFNB) severity and incidence on Flag-1, 22 September, GS78.

Treatment	NFNB		SFNB	
	Severity	Incidence (%)	Severity	Incidence (%)
1	5.1 a	96.7 a	2.7 a	93.3 a
2	1.2 bc	50.0 de	0.2 c	36.7 efg
3	1.2 bc	46.7 e	0.1 c	30.0 efg
4	1.2 bc	66.7 b-e	0.0 c	20.0 fg
5	2.2 bc	80.0 abc	0.4 bc	46.7 cde
6	1.6 bc	66.7 b-e	0.7 bc	70.0 abc
7	1.7 bc	70.0 a-e	0.2 bc	43.3 def
8	2.1 bc	76.7 a-d	1.0 b	80.0 ab
9	2.5 b	73.3 a-e	0.7 bc	70.0 abc
10	2.6 b	90.0 ab	0.3 bc	40.0 def
11	1.7 bc	83.3 abc	0.7 bc	63.3 bcd
12	1.4 bc	80.0 abc	0.1 c	23.3 efg
13	0.9 c	46.7 e	0.1 c	26.7 efg
14	2.0 bc	66.7 b-e	0.7 bc	70.0 abc
15	1.3 bc	60.0 cde	0.1 c	13.3 g
Mean	1.9	70.2	0.5	48.4
LSD (P=0.05)	1.6	29.1	0.8	24.7
P-Value	0.002	0.034	<0.001	<0.001

Similar to the plot assessment done at GS48, when looking at the Flag-1 leaf, the untreated control has the significantly highest incidence and severity of both diseases. Single application of a fungicide at any of the growth stages did control disease more than the untreated, however not to a satisfactory level.

Table 3. Green leaf retention (GLR %) on the top 4 leaves, 22 September, GS78.

Treatment	GLR (%)			
	Flag	F-1	F-2	F-3
1	60.7 -	37.5 e	12.7 f	0.8 -
2	73.0 -	60.2 a-e	32.1 cde	4.4 -
3	72.5 -	69.0 a-d	30.8 de	6.8 -
4	77.6 -	76.0 abc	46.3 a	7.6 -
5	76.7 -	72.7 a-d	41.7 abc	4.4 -
6	74.3 -	57.7 b-e	27.6 de	3.8 -
7	68.4 -	53.3 cde	29.2 de	6.5 -
8	70.9 -	50.7 de	25.7 de	5.3 -
9	71.2 -	53.5 cde	22.3 ef	2.4 -
10	72.2 -	59.5 a-e	34.6 cd	4.0 -
11	76.2 -	82.2 a	31.8 cde	4.0 -
12	74.0 -	77.7 ab	45.3 ab	4.1 -
13	67.8 -	52.8 de	34.5 cd	4.8 -
14	76.7 -	58.7 b-e	35.2 bcd	7.2 -
15	77.5 -	73.2 a-d	46.3 a	3.5 -
Mean	72.7	62.3	33.1	4.6
LSD (P=0.05)	ns	22.7	10.3	ns
P-Value	0.424	0.02	<0.001	0.842

Treatments which had three or more applications of various fungicide in general had a higher green leaf retention on Flag-1 and Flag-2. The untreated and single application treatments had significantly lower GLR.

Table 4. Details of the management levels.

Sowing date:		20 April
Seed Rate:		200 Seeds/m ²
Sowing Fertiliser:		139 kg MAP/MOP
Seed Treatment:		Vibrance / Cruiser
Grazing:		Nil
Nitrogen:	31 May	55 kg N/ha (20K)
	30 Jun	32 kg N/ha
PGR:	1 Jul	Moddus Evo 200 mL/ha
Fungicide:	1 Jul (GS31)	As per treatment list
	31 July (GS39-49)	As per treatment list
	12 Sep (GS71)	As per treatment list